

Appendix—Participation Incentives and Screening: A Graphical Analysis

The graphic analysis presented here is designed to help illustrate ideas presented in the text. We assume that program decisionmakers allocate a fixed budget among producers. Depending on the extent to which policy-makers employ tools that enhance environmental cost-effectiveness (e.g., bidding, performance-based screening), the potential for environmental gain can vary widely.

For the sake of clarity, we simplify the problem by assuming:

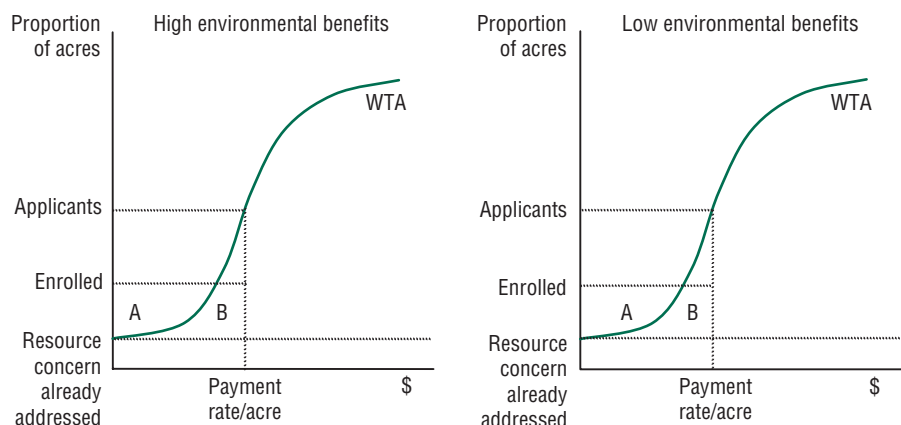
- Producers all address the same resource concern(s);
- Producers can be divided into “high-benefit” and “low-benefit” groups;
- Fixed payments are the same for all producers (as may be the case for management incentive payments within a single county);
- The distribution of WTA is the same for high- and low-benefit producers;
- The same proportion of high- and low-benefit producers have previously addressed the resource concern.

Here (fig. A), payments are fixed across producers without regard to costs or benefits. Payments are available for newly adopted practices only. For the payment rate shown, not all applicants can be enrolled. The screen reduces participation to match the budget (area A+B). Area A represents the cost of adopting new practices while area B represents surplus to the producer. In theory, a lower payment rate would reduce surplus to producers while enrolling the same producers in the program. However, program decision-makers are unlikely to know the exact location of the WTA curve.

Because WTA is distributed in the same way across producers, an equal proportion of high-benefit and low-benefit producers accept the payment and address the resource concern. If producers in the high-benefit category were more likely to have low costs, environmental gain would increase. If they were more like to have high costs, environmental gain would decline.

Appendix figure A

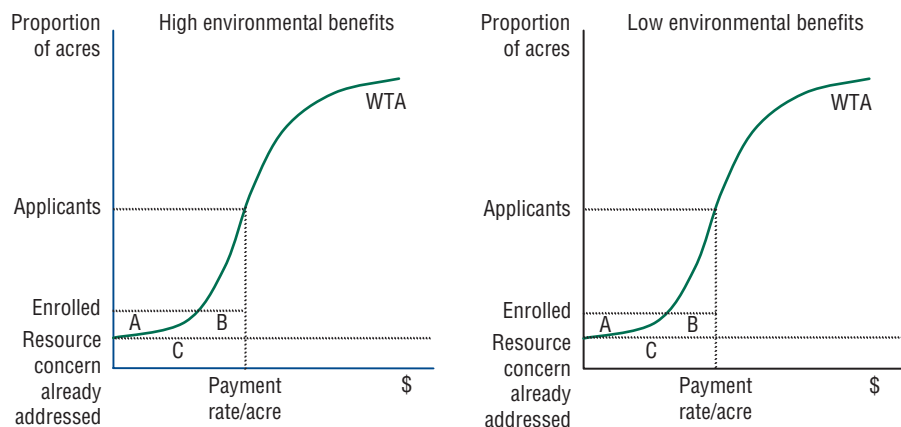
Fixed payments with allocative screening



In figure B, a stewardship payment component is added by extending payments to include previously adopted practices as well as new practices at the same payment rate. Given the fixed budget, the proportion of acres enrolled (and associated environmental gain) declines because budget resources are devoted to stewardship payments (area C). Other, somewhat less lucrative stewardship payments could be devised if it is possible to distinguish existing conservation practices from newly adopted practices. For structural practices, it is easy to detect existing practices. For some management practices, it could be quite difficult.

Appendix figure B

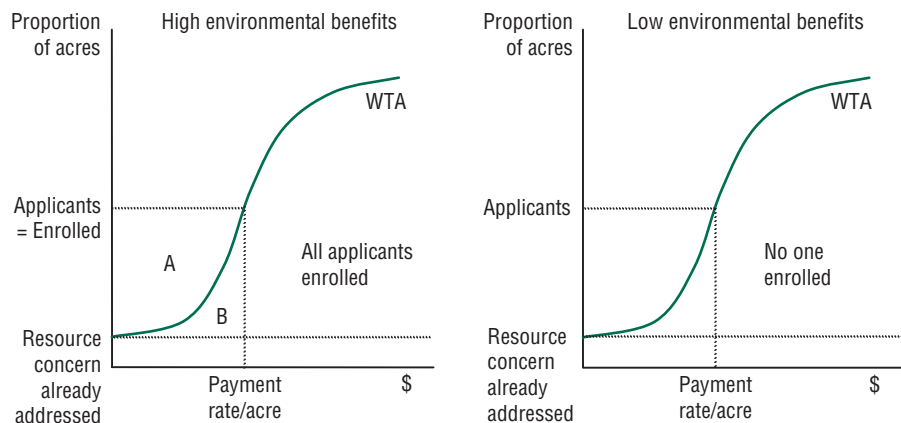
Fixed payments with allocative screening and stewardship payments



In figure C, performance-based screening shifts participation toward high-benefit producers. While the payment rate remains fixed, the screen gives preference to high-benefit producers. Because cost (in terms of program budget) is constant across producers while benefits are not, as much funding as possible is directed to high-benefit producers (as depicted above, all funding goes to high-benefit producers, areas A+B). In reality, there would be variation in contract cost—not all funding would go to producers yielding the highest benefit.

Appendix figure C

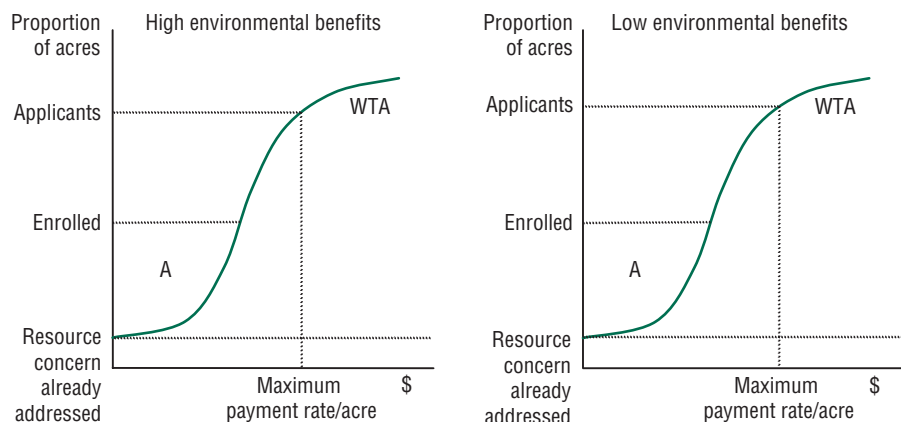
Fixed payments with a performance-based enrollment screen



If payments are based on bids and enrollment is truly competitive, producers will bid payments down to roughly the level of their WTA (payments = area A in figure D). Because producers no longer receive surplus as in the fixed-payment case, the enrollment screen can be relaxed, increasing program enrollment and environmental gain. Note that the number of applicants depends on the maximum payment rate. Everyone with WTA less than the maximum payment rate applies for the program.

Appendix figure D

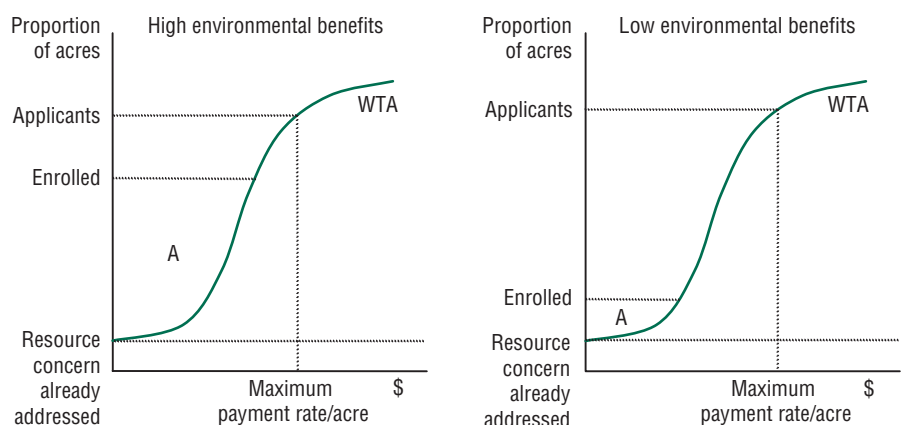
Bid-based payments



If the screen is based on environmental performance, program decision-makers can target participation toward high-benefit producers (fig. E). However, because the cost of contracts varies, cost-effectiveness may be obtained by seeking a balance between benefits and costs, retaining some low-benefit producers because they can realize these benefits at a low cost.

Appendix figure E

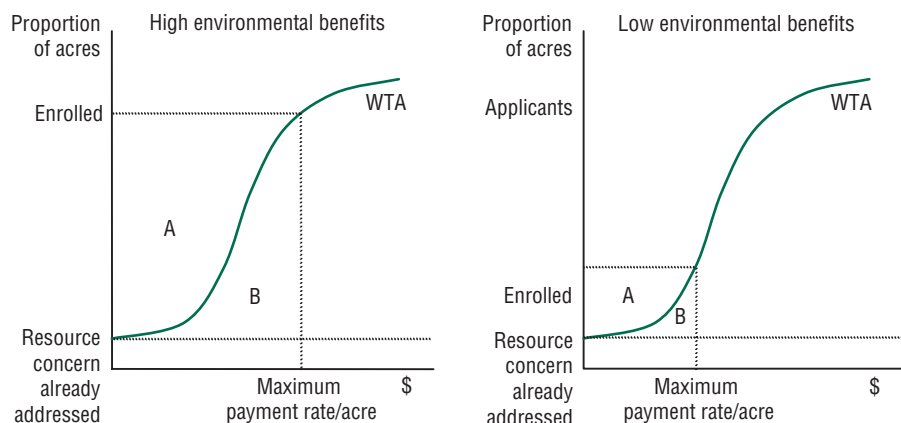
Bid-based payments with a performance-based enrollment screen



Finally, in figure F, performance-based payments direct higher levels of participation toward high-benefit producers through the use of higher payments (assuming the equal distribution of costs among high- and low-benefit producers). If payments (areas A + B) exceed the budget, a screening device will be needed to reduce expenditures.

Appendix figure F

Performance-based payments



Web Appendices A-C are available online only.

You can find them on the ERS website at
www.ers.usda.gov/publications/err5/webappendix.